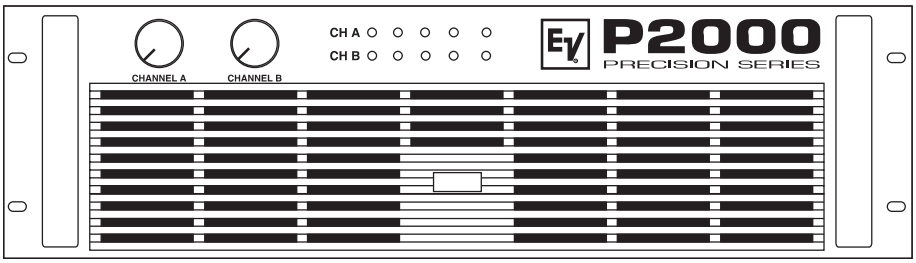
Electro-Voice®

P2000

Precision Series™ Power Amplifier



- **560 watts per channel at 8 ohms, 900 watts per channel at 4 ohms, 1,200 watts per channel at 2 ohms**
- **Neutrik Speakon® output connectors allow use of heavy-gauge speaker wire for low-loss connections**
- **Extremely low (<0.01%) dynamic distortion ensures excellent sound quality**
- **Three-year parts-and-labor warranty**

SPECIFICATIONS

Conditions:

1. 0 dBu = 0.775 V rms.
2. Dual-mode ratings are for each channel, both operating, unless noted.
3. 120-volt ac line voltage maintained throughout testing.

Continuous Rated Output Power (20-20,000 Hz at less than 0.1% THD, both channels driven per EIA RS-490),

Dual Mode, 2 Ohms:
1,000 watts

Bridged Mode, 4 Ohms:
2,000 watts

Dual Mode, 4 Ohms:
800 watts

Bridged Mode, 8 Ohms:
1,600 watts

Dual Mode, 8 Ohms:
500 watts

Continuous Rated Output Power (1 kHz, 1% THD, both channels driven per EIA RS-490),

Dual Mode, 2 Ohms:
1,200 watts

Bridged Mode, 4 Ohms:
2,400 watts

Dual Mode, 4 Ohms:
900 watts

Bridged Mode, 8 Ohms:
1,800 watts

Dual Mode, 8 Ohms:
560 watts

Power Bandwidth (+0, –1 dB, reference 1 kHz), Any Mode, 4 Ohms:
10-30,000 Hz

Frequency Response (+0, –3 dB, reference 1 kHz/1 watt):
<10-30,000 Hz

Voltage Gain, 1 kHz, Any Mode, Constant-Gain Option:[1]
26 dB

Input Sensitivity, 1 kHz, Dual Mode for 800 Watts into 4 Ohms:
0 dBu (775 mV)

Maximum Input Level (reference 1 kHz):
+20 dBu (7.75 V)

Input Impedance (per channel, 20-20,000 Hz), **Balanced**:
20 kilohms

Phase Response (at rated power, any mode, 10-30,000 Hz):
±22.5 degrees

THD Plus Noise at 1 kHz (at rated power, measurement bandwidth 80 kHz):
<0.01%

IMD (SMPTE) (60 Hz/7 kHz, typical, at rated power; see Figure 2):
<0.01%

DIM 30 (composite square-sine wave band-limited to 30,000 Hz):
<0.01%

DIM 100 (composite square-sine wave band-limited to 100,000 Hz):
<0.01%

Rise Time (10% to 90% at rated power, any mode):
<2.5 microseconds

Slew Rate, Any Mode:
>35 V/microsecond

Damping Factor, Any Mode:
>300

Amplifier Protection:
Excessive output voltage; shorted loads; excessive phase shift; rf interference; overtemperature; excessive back EMF; In-rush current limiter

1. Configured for constant-gain option, all Precision Series™ amplifiers, regardless of power rating, have a maximum voltage gain of 26 dB.

Load Protection:
Start-up/shutdown transients; dc fault; infrasonic signals; low ac line voltage; nonlinear signal limiter

Output Topology:
True complementary symmetry with ungrounded collectors (no mica insulators means better heat transfer)

Output Devices,

Total Number: 32 devices

P_d(max) Rating: 250 watts

I_c (collector current): 20 amps dc

T_j(max): 200 °C (392 °F)

Controls and Switches,

Rear:
Hi-Lo-Cut Filter(On/Off); Bridged Mode switch (Bridged/Normal); Limiter mode (Fast/Slow); Circuit ⊥ To Chassis Switch (Grounded/Ungrounded); Input Routing (Parallel Mono or Dual Stereo)

Front:
Two calibrated input level controls; power switch

Front-Panel Indicators:
Five LED's per channel (10 total) for power on, input signal, output signal, limiter on and protect on

Connections,

Input:
3-pin female XLR-type connectors for each channel in parallel with a 3-pin male XLR-type output connector for easy signal routing; the XLR connectors are wired according to the IEC 268 standard: pin 1 shield, pin 2 positive, pin 3 negative

Output:
Neutrik Speakon® NL4MP for channels A, B and for bridged mode

Power:
12-gauge, 3-wire, permanently attached power cable; no ac plug supplied

P2000 SPECIFICATION GRAPHICS

FIGURE 1 — P2000 Dimensions

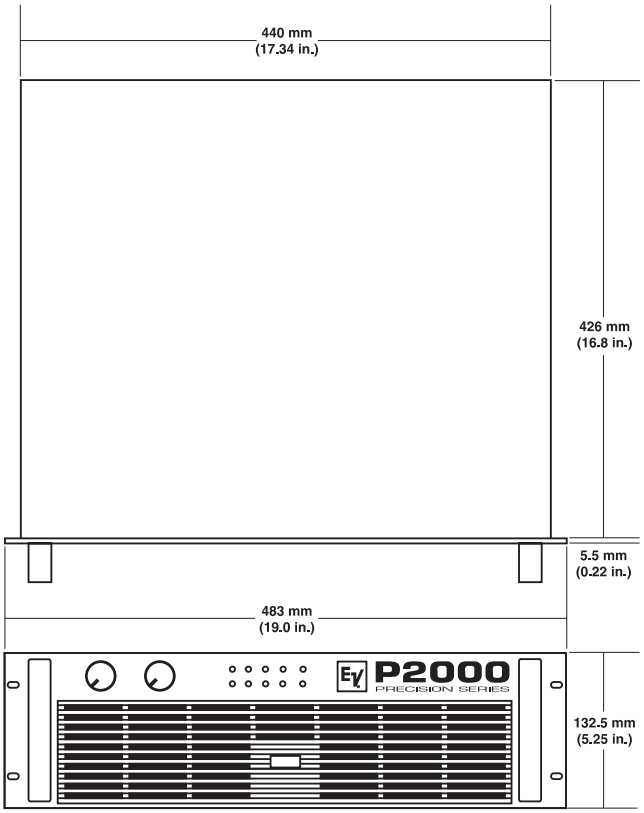


FIGURE 2 — P2000 Intermodulation Distortion (SMPTE 60 Hz/7 kHz) vs. Power

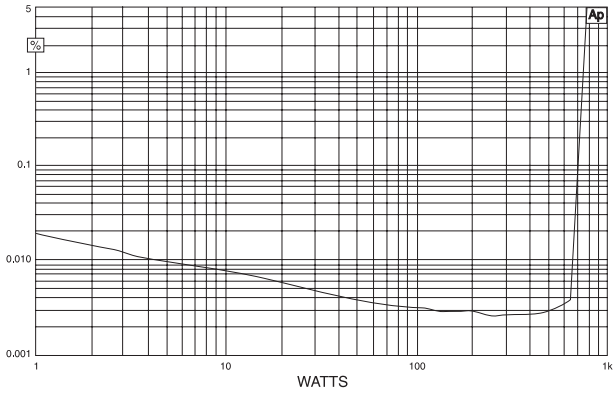
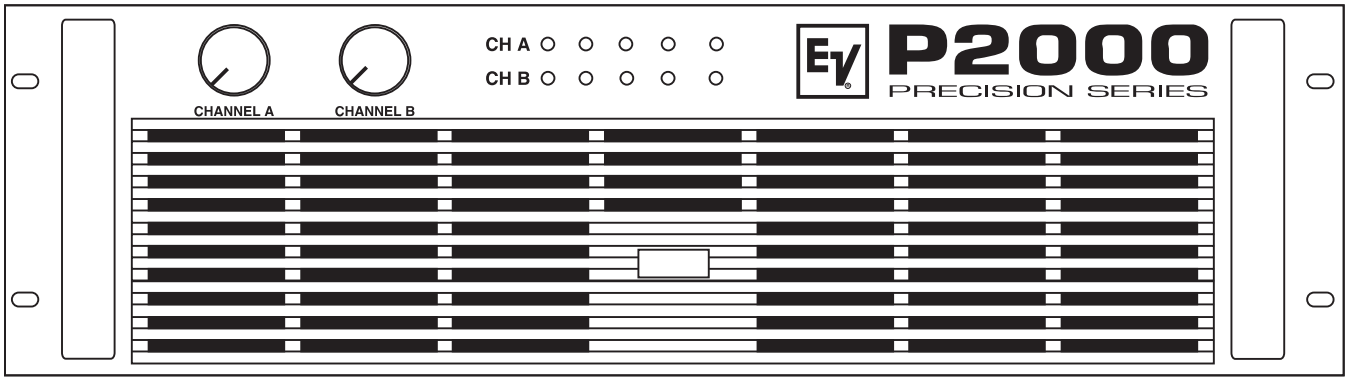
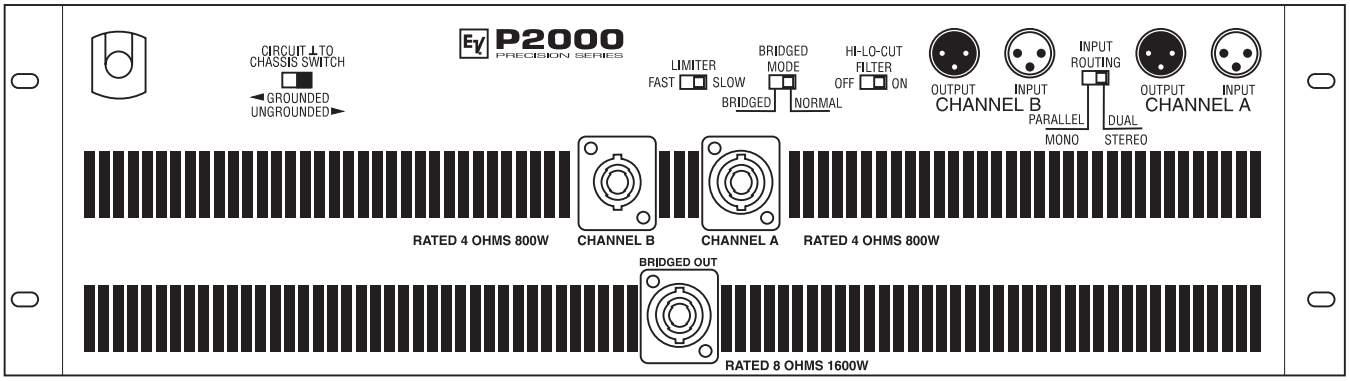


FIGURE 3 — P2000 Front and Rear Panel





Operating Voltage:
120 V, 60 Hz ac

Power Consumption (both channels operating in dual mode, 1/8 power), 4 Ohms:
800 VA

Dimensions, (See Figure 1)

Height:
132.5 mm (5.25 in.)

Width:
483 mm (19.0 in.)

Depth:
426 mm (16.8 in.)

Color:
Gray

Net Weight:
26 kg (57.2 lb)

Shipping Weight:
30 kg (66 lb)

DESCRIPTION

The Electro-Voice P2000 Precision Series™ amplifier is a very-high-quality power amplifier designed to elicit maximum performance from any speaker system. Its ultralow distortion and powerful amplifiers ensure that program material will be amplified very accurately.

Each channel of the P2000 delivers more than 500 watts continuous average power into 8 ohms, 800 watts into 4 ohms and 1,000 watts into 2 ohms over the full audio frequency range. In the bridge mode, the amplifier can deliver more than 1,600 watts into 8 ohms and 2,000 watts into 4 ohms at less than 1% THD. The power supply, with its large toroidal transformer, gives the amplifier impressive headroom and current output.

The P2000 contains 32 high-power output devices with 8,000 watts of dissipation capability. These devices are protected from overheating by four, three-speed, temperature-sensitive fans. The fans are quiet enough to permit use of the P2000 in noise-sensitive applications such as recording studios and houses of worship.

The output devices are mounted to a massive, extruded-aluminum heat sink that is engineered to minimize thermal gradients and allow the amplifier to operate safely into low-impedance loads. The output devices have a maximum junction temperature of 200 °C (392 °F), so high operational temperatures present no problems. The output devices are mounted directly to the heat sink without mica insulators to ensure better dissipation of heat.

Many electronic circuit innovations exist in the P2000. Among the most novel of these circuits is the Mirrored Frontend Power Supply Bridge™. This design ensures complete symmetry for each bridged amplifier and both signal polarities, and eliminates asymmetrical rise and fall times. The Dual Differential Discrete Topology™ is part of the front end of the amplifier and uses discrete electrical components instead of integrated circuits to help the P2000 achieve its phenomenally low distortion.

The P2000 has sophisticated protection circuits that guard it and the load from problems. Protection circuits guard against overload, overtemperature, shorted outputs, radio-frequency interference and dc faults. The output devices are protected against damage from reverse feeding of electrical energy (back EMF) and are switched on via relays to avoid transients which could damage speakers.

The P2000 has built-in limiters to protect speakers from the deleterious effects of amplifier clipping. The limiter's action is governed by very sophisticated input/output comparators which have acoustically optimized time constants to preserve the integrity of the source. The limiter's time constants are switchable fast/slow, so the limiter may be matched to the application for which the amplifier is being used.

The P2000 has built-in switchable high- and low-cut filters. These filters attenuate infrasonic and ultrahigh-frequency signals, preventing them from being amplified; this allows more effective use of the amplifier's power and adds a measure of load protection. These filters are switchable on/off for use in applications utilizing frontend units (like crossovers or equalizers) which have these filters built-in.

A multifunction display keeps the user informed of the operating status of the amplifier. Separate LED displays for each channel show power on, input signal, output signal, limiter on and protection active.

The P2000 has electronically balanced XLR-type input and output connectors that allow easy, problem-free connections and signal routing. The P2000 has an input routing switch that allows selection of either normal dual-channel operation, or parallel mono operation, which routes an input to both channels but still allows for independent level control. The P2000 also has a constant-gain option which allows the voltage gain to be fixed. This permits different amplifiers to be used in fixed installations without rebalancing, and ensures headroom is not wasted.

The P2000's professional Neutrik Speakon® output connectors provide a sturdy, reliable connection and allow use of heavy wire for loss-free signal transmission. There are separate output connectors for channels A and B, and for the bridge mode. The bridge-mode connector is sealed with a plastic cover to prevent connection errors.

To prevent ground loops from occurring, the P2000 is equipped with a ground-lift switch. When the amplifier is operated in a rack with units of different ground potential, the switch may be adjusted to eliminate hum.

Calibrated, detented potentiometers on the front panel regulate the gain of the P2000. The panel nomenclature shows the amount of attenuation accurately.

The P2000 also has a constant-gain option which, with input level controls full clockwise, provides a 26-dB voltage gain that is identical to that of all Electro-Voice Precision Series™ amplifiers in the constant-gain option, regardless of power rating. This makes it possible to exchange amplifiers of different power ratings without upsetting delivered sound pressure levels or spectral balances.

The Electro-Voice P2000 is the choice for serious, professional amplification applications which require optimum sound quality, speaker protection, and the highest level of construction quality and long-term reliability.

Figure 3 shows P2000 front and rear panels. The block diagram is shown in Figure 4.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The power amplifier shall be a dual-channel model of solid-state design employing high-power output devices in a true-complementary-symmetry output circuit. It shall be capable of operating from a 120/200/220/240-V, 50/60-Hz ac line. The power amplifier shall contain a modern limiter circuit with switchable time constants to protect the load from damage by amplifier clipping.

The amplifier shall contain sensing circuitry to provide protection for the output transistors against overtemperature, excessive output voltage, radio-frequency interference, shorted loads, excessive phase shift and back-EMF current. The load shall be similarly protected against infrasonic signals, start-up/shutdown transients, low ac line voltage and dc.

Rear-mounted panel controls shall include an input routing switch for selecting dual/stereo or parallel mono operation, a switch for turning the infrasonic and ultrasonic filters on or off, a switch for selecting dual/stereo or bridged operation and a switch for selecting fast or slow speed for the built-in limiters. Input connections for each channel shall include a 3-pin female XLR-type connector wired in parallel with a male 3-pin XLR output connector for signal routing. Output connectors shall be Neutrik Speakon® NL4MP's for channels A and B, and for bridged operation.

Front-panel indicators shall include power on, input present, output, limit and protect LED's for each channel. Front-panel controls shall include a power switch and level controls that shall be calibrated, detented potentiometers and have accurate markings. The amplifier shall have a constant-gain option that, with input level controls full clockwise, provides a 26-dB voltage gain that is identical to that of all Electro-Voice Precision Series™ power amplifiers.

The power amplifier shall meet the following performance specifications: maximum input voltage, 7.75 V rms; rated output power from 20-20,000 Hz at less than 0.1% THD, each channel, 500 watts into 8 ohms, 800 watts into 4 ohms, 1,000 watts into 2 ohms, 1,600 watts bridged into 8 ohms and 2,000 watts bridged into 4 ohms; hum and noise, at least 100 dB (A weighted) below rated output power; frequency response, 10-30,000 Hz (+0, –3 dB) at any output power up to rated output power; damping factor, >300 at any frequency up to 1 kHz in any mode with an 8-ohm load; THD (total harmonic distortion), <0.05% at 1 kHz at rated power; transient intermodulation distortion (DIN 30 or DIN 100), <0.01%; crosstalk, <70 dB below rated output power. Dimensions shall be 132.5 mm (5.25 in.) x 483 mm (19.0 in.) x 426 mm (16.8 in.) hwd. Net weight shall be 30 kg (66 lb). Color: gray.

The power amplifier shall be the Electro-Voice P2000.

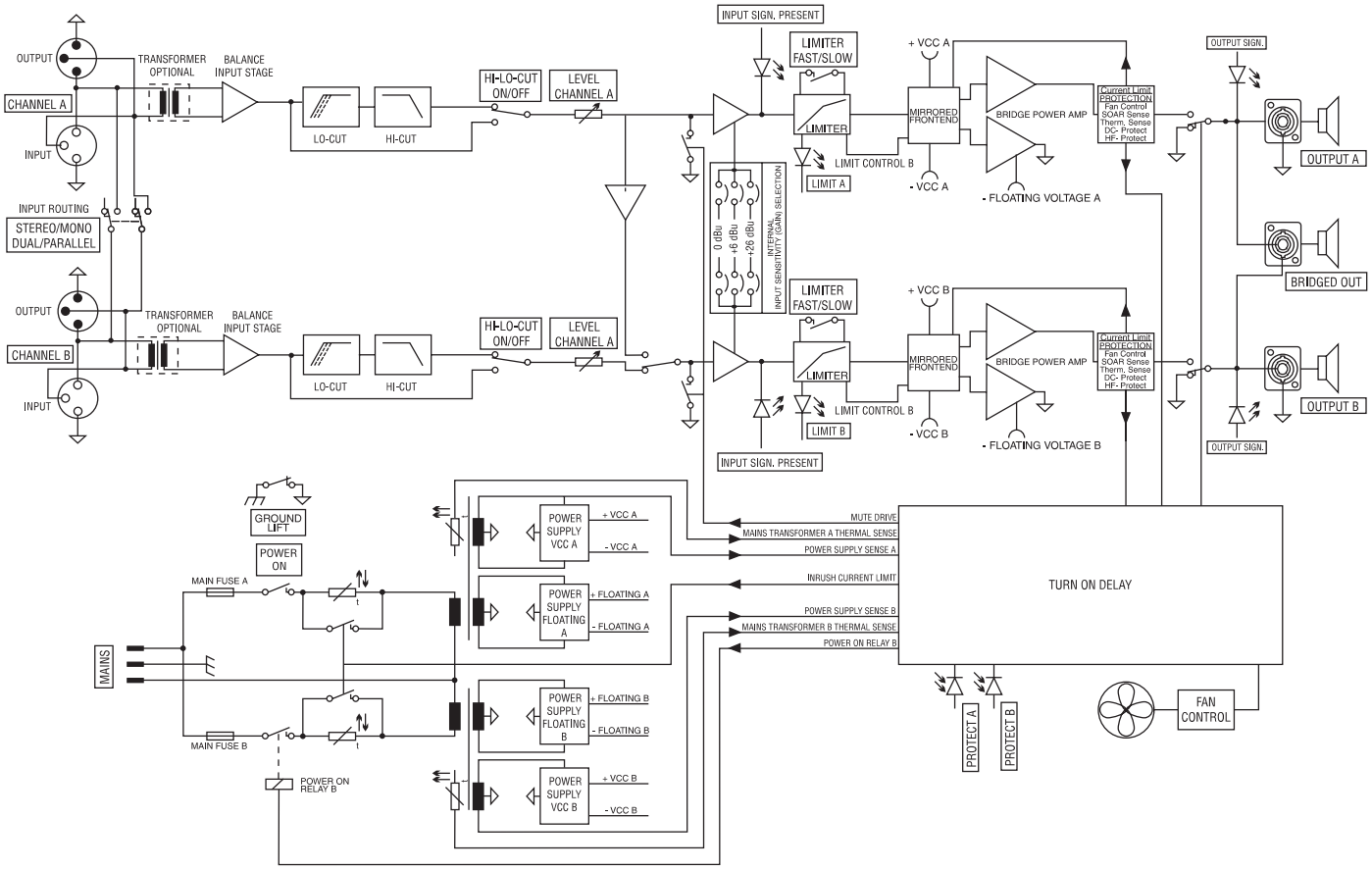
UNIFORM LIMITED WARRANTY
Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831)**. Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Electro-Voice Electronics are guaranteed against malfunction due to defects in materials or workmanship for a period of three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.

FIGURE 4 — P2000 Block Diagram



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